

*Afr. J. Biomed. Res. 13 (May 2010) 93 - 98*

*Research article*

# **Patient Medication Knowledge Governing Adherence to Asthma Pharmacotherapy: A Survey in Rural Lagos, Nigeria**

**Omole, M.K and Ilesanmi, N. A**

*Department of Clinical Pharmacy and Pharmacy Administration, Faculty of Pharmacy,  
University of Ibadan. Ibadan, Nigeria*

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**ABSTRACT:** Asthma is a chronic disease and often requires complex management. This study was undertaken in four pharmacies—V-Ninat Pharmacy, Videc Chemists, Tomabel Pharmacy and Josbet Chemists, all in Isolo, Lagos, to determine the level of adherence to the anti-asthmatic drugs by asthmatic patients who participated in the study. Data was collected using structured questionnaires administered to patients coming into the pharmacies. The questionnaire was administered during a one-on-one interview. Times of recruitment were varied in an attempt to avoid any bias or restriction of the sample in relation to gender, age, or employment status such as trading and teaching. There were 73 participants in the study. The participation rate was 67 (92%) of those individuals eligible. The mean age of participants was 57( $\pm$  17.7) years. 30 (45.2%) of respondents were males and 37 (54.8%) were females. The mean number of occasion of exercise per week was 28.26. Twenty six (26) (39.0%) of patients used “preventer” medication, that is medication that prevents asthmatic attack on those who frequently suffer from asthma, and 5 (7%) never used it. Participants offered a number of reasons explaining their non-adherence, the most common 24 (58.5%) were those who forgot to take “preventer” medication. Nine (9) (21.9%) were too busy, 5 (12.2%) were concerned about side effects and 3 (7.3%) did not believe it was effective. Other responses were offered only by individual participants and were not endorsed by the participant sample. Older patients adhered to their medication regimen more closely than younger patients. Fifty (50) (68%) patients used “preventer” medication and 17 (26%) patients used “reliever” that is, agent that relieves asthmatic attack on those who frequently suffer from asthma. Based on these findings and the result of hypothesis testing ( $p < 0.05$ ), the study established poor medication knowledge, suboptimal device technique, and disturbing levels of patients adherence with management recommendations. Asthma education strategies need to be modified to engage patients with low asthma knowledge to achieve improved patient outcome. Further, strategies should be employed to motivate patients to use “preventer” medications during the times they feel well.

**Key Word:** *Asthma, “Preventer” medication, “Reliever” medication, Patient*

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## **INTRODUCTION**

Asthma is defined as chronic inflammatory disorder of the airways which emphasizes that asthma is not simply a disease of smooth muscle bronchoconstriction as was once thought.<sup>1</sup> Asthmatic episodes may be triggered by

such things as exposure to an environmental stimulant (or allergen) such as cold air, warm air, moist air, exercise, exertion or emotional stress. An estimated 20% to 50% of patients do not take their medications as prescribed and are said to be non adherent or noncompliant with therapy (Blake and Kelly, 2006). In the setting of chronic medical conditions such as hypertension, asthma and hypercholesterolemia, medication non adherence leads to worse medical treatment outcomes, higher hospitalization rates, and increased health care costs (Sokol *et al*, 2005). Because of this, adherence has been called “the key mediator between medical practice and patient outcomes” (Kravitz and Melnikow, 1987). Adherence has been conceptualized as active, voluntary, collaborative involvement of the patient in a mutually acceptable course of behavior to produce a desired preventative or

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\*Address for correspondence: Tel: +234-8064646359;  
E-mail address: *kayodeomole06@yahoo.com*

therapeutic result (Meichenbaum and Turk, 1987). Some consider that the terms adherence and compliance are synonymous. By adopting this definition, reasoned agreement with the management plan on the part of the patient is implied. Whilst asthma management plans incorporate a number of recommended health behaviors, the role of medication is paramount. Medication adherence has been defined as the amount of time a patient takes a given medication as prescribed (Jones *et al*, 2003). Rate of non adherence with pharmacotherapy across all chronic disease states including asthma is high, ranging from 40%–70% (Clarke and Partridge, 2002; Sawyer, 2003) with 39% non compliance rate in a group of moderate to severe asthmatics (Tertesell, 1993). However, the level of patient knowledge concerning the disease had no significant effect on compliance to drug therapy. Patients should be educated about their drug therapy including how the drugs act so that they can make logical decisions regarding their treatment, since the use of medicinal drugs is not founded on medication knowledge alone but also on lay reasoning and logic (Lumme-Sandt *et al*, 2000). People with asthma can lead a normal and healthy life, and one major step in ensuring this is the adherence to their management plan. A significant challenge for healthcare professionals is motivating patients to take “preventer” medication when asymptomatic (Anarella *et al*, 2004). The aim of this study was to evaluate patient knowledge of asthma pharmacotherapy and adherence with the goal of providing and promoting pharmaceutical care.

## MATERIALS AND METHODS

The instruments that were used to gather information were mainly structured questionnaires and interviews. The study population included 73 participants in four pharmacies in Isolo, Lagos, who were suffering from asthma between ages 21 and 70. No newly diagnosed asthmatic was included. Inclusion criteria were males and females aged 21 to 70 years suffering from asthma and have been on asthma therapy for a minimum of one year. Subjects who refused consent were excluded from the study.

All individuals entering the pharmacies were, after a brief introduction, asked if they had asthma and when confirmed were then invited to participate in the study. The questionnaire was administered by a one-on-one interview. Times of recruitment were varied in an attempt to avoid any bias or restriction of the sample in relation to their gender, age, or employment status.

A sample size of 73 randomly selected asthma patients was used using the inclusion criteria. This method entails using the most conveniently available subset of people; also called accidental sample. The convenience sampling method was used because patients were easily accessible and it is an inexpensive and quick procedure. A descriptive design was used to assess asthma knowledge, asthma control and therapy adherence.

A structured interview was conducted using a questionnaire designed to elicit information in the following areas: basic socio-demographics, asthma medication and management knowledge, and medication adherence. Questions were asked exactly as written and in the order specified by the interview schedule. During the interview, participants were asked to identify their medication, describe their treatment regimen and the mode of action of “preventer” and “reliever” medications. A coloured medication chart was used as a prompt because many patients cannot remember their medication names but are more likely to be able to identify them. Additionally participants were asked about their asthma management plan. Participants' medication adherence and skills at using medication devices were also assessed.

Data collected were then analyzed using descriptive statistics of frequency distribution and percentages were used as appropriate. Qualitative analysis was also carried out using chi-square (Statistical Packages for the Social Sciences, SPSS version 10.0).

For the purpose of this study, informed consent was obtained before the questionnaire was administered. Participants were made aware that participation was voluntary and that they had the right to refuse. The four pharmacies owners were granted approval to conduct this study.

## RESULTS

Table 1 shows the distribution of respondents according to age, gender and medication. There were 73 participants in the study. The participation rate was 67 (92%) of those individuals eligible, making up of 30 (45.2%) males and 37 (54.8%) females. The mean age of participants was 57 ( $\pm$  17.7) years. The mean number of occasions of exercise per week was 2.8. “Preventer” medication was used by 50 (74%) of participants; while 17 (26%) used “reliever” medication only to manage their condition. Of those using “reliever” medication, 3 (28%) used it more than 3 – 4 times per week.

Table 2 shows the Participants knowledge of mode of action of “preventer” and “reliever” medications. 20 (40%) had the clear knowledge of “preventer” medication

while 8 (47%) had the clear knowledge of the “reliever” medication. The basic knowledge of “preventer” medication was established in 28 (56%) of the participants while 7 (41.2%) had the basic knowledge of the “reliever” medication. Poor knowledge of “preventer” medication was observed in 2 (4%) of the patients and it was 2 (11%) with “reliever” medication. Only 26 (39%) of the participants used the correct dose of their medication at the correct time, while 28 (42%) used the correct dose at wrong time. 8 (12%) used their medication as much as they needed it and 4 (7%) did not use their medication at all.

Of the 67 respondents in this study, 26 (39%) used the medication as prescribed, thereby adherent to dose and dose frequency recommendations, 28 (42%) adhered to the right dose but not to frequency of use, that is, the time; 8 (12%) used the medications as much as they needed while the remaining 5 (7%) never used the medication. In all 41 (61%) did adhere to the medication regimen as prescribed (Table 3).

The major reason for non adherence identified in this study was forgetfulness (24 or 58.5%). Some other reasons included concern about side effects which was observed in 5 (12.2%) patients and a feeling that there was no need to take the medication when well who were 3 (7.3%) patients (Fig 1).

**Table 1:** Age, Gender and Medication Distribution of patients

	Frequency	% Percentage	Valid %	Cumulative %
<b>Age(yrs)</b>				
21-30	7	10.5	10.5	10.52
31-40	16	23.9	23.9	34.4
41-50	13	19.4	19.4	53.8
51 and above	31	46.3	46.3	100.0
<b>Total</b>	<b>67</b>	<b>100</b>		
<b>Gender</b>				
Male	30	45.2	45.2	45.2
Female	37	54.8	54.8	100.0
<b>Total</b>	<b>67</b>	<b>100</b>		
<b>Medication</b>				
Preventer	50	74	74.0	74.0
Reliever	17	26	26	100.0
<b>Total</b>	<b>67</b>	<b>100</b>		

**Table 2:** Participants knowledge of mode of action of “preventer” and “reliever” medications

Knowledge	Preventer		Reliever	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Clear	20	40	8	47
Basic	28	56	7	41.2
18Poor	2	4	2	11.8
<b>Total</b>	<b>50</b>	<b>100</b>	<b>17</b>	<b>100</b>

## DISCUSSION

In Nigeria, pharmacies are ideal sites for surveying people with chronic diseases such as asthma most of which are managed by prescribed medicines. Interview studies have been shown to produce better completion rates than any other types of questionnaire and they are

good method for administration of detailed or complex surveys (Bailey, 2001). Surveying at local pharmacies may however, introduce bias by recruiting people who are perhaps more concerned for their health (Lupton and Najman, 1995).

“Preventer” medication is a current treatment protocol that recommends medications such as inhaled

corticosteroid which helps to suppress inflammation and reduces the swelling of the lining of the airways in patient who has frequent need of “reliever” medication. With the proper use of “preventer” medication, asthmatic can avoid the complications that results from overuse of “reliever” medication. Asthmatic patients often stop their “preventer” medication when they feel well. This often results in further attack, and no long term improvement. 50 of the 67 patients were on “preventer” medication in this study.

In “reliever” medication, symptomatic control of episodes of wheezing and shortness of breath is generally achieved with fast acting bronchodilators. These are typically provided in pocket – sized, metered dose inhalers (MDI). In adult with poor ability to hold their breath for 10 seconds after inhaler use, an asthma spacer is used. The spacer which is plastic cylinder that mixes the medication with air is a simple tube that makes it easier to be dispersed with smaller, more fully inhaled puffs. A nebulizer which provides a larger, continuous dose can also be used. Nebulizer works by vaporizing a dose of medication in a saline solution into a steady stream of foggy vapour, which the patient inhales continuously until the full dosage is administered. In this study 17 of the 67 patients studied were on “reliever” medication.

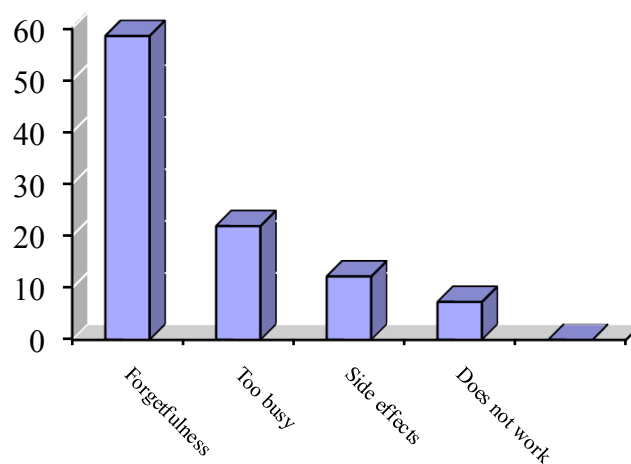
**Table 3:**

Different ways in which the respondents used the Inhaler medications

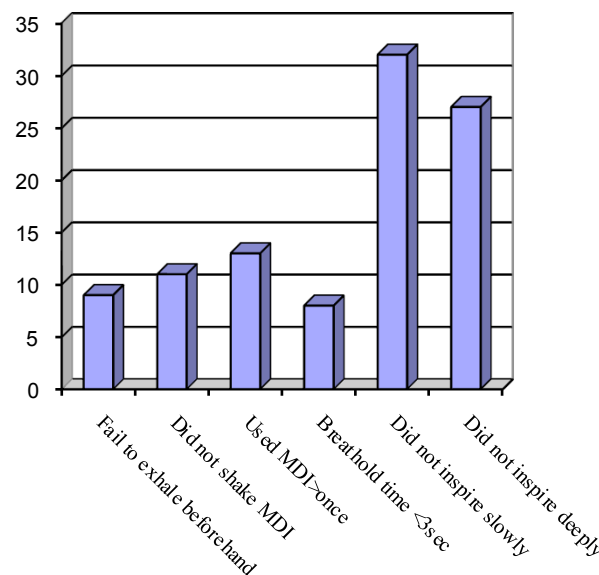
Adherence	Frequency	Percentage of respondents
Correct dose & time	26	39
Correct dose not time	28	42
As much as I need	8	12
Do not use	5	7
<b>Total</b>	<b>67</b>	<b>100</b>

This study also demonstrated that a substantial number of people with asthma lack the necessary knowledge to contribute effectively to their disease state management. Strategies need to be developed to engage patients with low asthma knowledge in asthma education programs to achieve improved patient outcomes, including quality of life. Further, strategies need to be tailored to motivate patients to take preventive medication during times when they feel well. Although there is a paucity of research addressing this issue, these results are comparable to previous Australian research that identified that 90% of those

surveyed were able to distinguish their “preventer” and “reliever” medications and when to use them (Anon, 2000). However, other research conducted in Trinidad between 1997-2000 established that only 53% of chest clinic patients could provide accurate reasons for using “preventer” and “reliever” medications (Hartzema, 2000).



**Figure 1:** Reasons for non-adherence by the asthmatic patients



**Figure 2:** Observed errors with metered dose inhaler (MDI) technique

However of great concern was the overuse of “reliever” medication which occurred in 5 (30%) of those using “reliever” medication alone to manage their

asthma. If a patient is over reliant on this medication they may develop tachyphylaxis and when they need bronchodilating action their “reliever” will not be effective. Regular use of “reliever” medication alone has been associated with a 2.6 increased risk of death or near death (Chumbers 1999). Clearly, asthma management guidelines would indicate the use of “preventer” medication in this group. Poor adherence by people with asthma is extensively documented especially for “preventer” medications (Sawyer, 2003). In this study, only 26 (39%) used the medication as prescribed, thereby adherent to dose and dose frequency recommendations. This is consistent with previous works where 38% of respondents used preventive medications prescribed by their doctors (Anarella *et al*, 2004).

The major reason for non adherence identified in this study was forgetfulness. This is not unique to this study and has been documented by other researchers (Chapman *et al*, 2000; Sladder *et al*, 2002). Some other reasons included concern about side effects and a feeling that there was no need to take the medication when well. This study therefore identified areas for improvement in asthma management, which included education about the risk/benefit ratio of preventers. Although the impetus to deliver pharmaceutical care should arise from a sense of individual and professional responsibility, pharmacists are also mandated under provisions of the Omnibus Budget Reconciliation Act of 1990 (OBRA'90) which went into effect in January 1993 to provide expanded services. Under OBRA'90 among other duties, a pharmacist must offer to counsel all Medicaid patients on their medications as well as to maintain patient profiles that contain perfect demographic information, a record of all medications taken including drugs used for asthma, allergies, adverse drug reactions, disease states including asthma and pharmacist must be relevant to an individual patient's drug therapy. These records are intended to facilitate the OBRA'90 requirement of prospective drug use review with the intention of identifying and resolving any actual or potential medication related problems, including the problem of medication non compliance or non adherence (Bender *et al*, 1997).

The National Asthma Education and prevention programme (NAEPP) guidelines stress a partnership between the patients and care givers including the pharmacists. A satisfying relationship with caregiver is most important factor for changing health care behaviour including medication adherence (Bender *et al*, 1997). Skill that pharmacists should use includes making direct eye contact, expressing genuine interest, explaining all recommendations thoroughly and in language the patients can understand, praising good

medication adherence and expressing a willingness to modify the treatment plan in accord with the patient's concerns. The pharmacists may need to communicate the patient's desires to the physician. Additional strategies to address poor adherence identified in this study include reducing the dose frequency, and choosing the same type of delivery device for both “preventer” and “reliever” medications.

This study identified suboptimal MDI device technique with the most frequently recorded errors related to the required changes in ventilatory pattern and breath holding (fig.2). This is consistent with the literature (Hartzema, 2000; Pain, 2003; Reed, 2004). Dry powder devices are generally considered to present fewer problems due to a reduced requirement for patient coordination (Reed, 2004). However, research has established that patients tend to lack confidence in this device because a visible aerosol is not produced nor sensed on the pharynx. Despite the differences in devices, the critical feature in dosing efficacy rests more on patient skill than the features of the device itself (Pain, 2003).

## REFERENCES

- Anarella J, Roohan P, Balistreri E, et al. (2004)** A survey of Medicaid recipients with asthma: perceptions of self-management, *a*; 125:1359–67.
- Anonymous. (2000)** Seretide's combination therapy advances asthma management. *Aust J Pharm*; 81:1028–9.
- Bailey, M. (2001)** Morbidity and costs. *Current allergy and chemical immunology*; Vol 14 (2):10 – 12
- Bender B, Milgrom H, Rand C. (1997)** Non adherence in asthmatic patients: Is there a solution to the problem? *Ann Allergy Asthma Immunol* 79: 177 – 185.
- Burns and Grove S.K (1997):374. *The Practice of Nursing Research. Conduct, critique and utilisation.* 4<sup>th</sup> Ed. W.B. Saunders Company, Philadelphia
- Chambers C.V. (1999)**. Issac Report on asthma prevalence in African school children 13-14 years. *Respiratory medicine*; 93:88-94
- Chapman KR, Walker L, Cluley S, et al (2000)** Improving patient compliance with asthma therapy. 94:2–9; *Respir Med*.
- Clark N.M, Partridge M.R (2002)**. Strengthening asthma education to enhance disease control. *Chest*. 121:1661–9.
- Hartzema A. (2000)**: Quality improvement in pharmacotherapy– preliminary results from the United States. *Pharm J*. 265:498.
- Jones C, Santanello NC, Boccuzzi SJ, et al. (2003)** Adherence to prescribed treatment for asthma: Evidence from pharmacy benefits data. *J Asthma*. 40:93–101.
- Kathry Blake and H. William Kelly (2006)** *Asthma in Text book of Therapeutics, Dry and disease management.* Richard Heelins. David j Quan, Eric T. Herfindal, Dick R Gouly 8<sup>th</sup> Ed. 877-918.

- Kravitz RL, Melnikow J. (2004)** Medical adherence research: time for a change in direction? *Med Care.* 42:197-199.
- Lumme-Sandt K, Hervonen A, Jylha M. (2000)** Interpretative repertoires of medication among the oldest-old. *Soc Sci Med;* 50:1843–50.
- Lupton, GM.; Najman JM (1995).** *Sociology of health and illness: Australian readings.* 2nd Ed.
- Meichenbaum, D.; Turk, DC. (1987)** Treatment adherence: terminology, incidence and conceptualisation. *Facilitating treatment adherence.* New York: Plenum Pr.pp. 19–39.
- Pain MCF. (2003)** Delivering inhaled asthma therapy. *Aust Prescriber;* 26:5–7.
- Polit D.F, Hungler B.P. (2001):** *Nursing Research Principles and methods.* Philadelphia. Lippincott.
- Reed CE. (2004)** Inhaled corticosteroids: why do physicians and patients fail to comply with guidelines for managing asthma? *Mayo Clinic Proc;* 79:453–5.
- Rucker NL (1992) New Federal DUR requirements for ccess and care. *Chest Pharmacist in 1993.* *Am Pharm NS* 32: 44 – 46, 58.
- Sawyer SM. (2003)** Action plans, self-monitoring and adherence: changing behaviour to promote better self-management. *Med J Aust.* 177:S72–4.
- Slader CA, Reddel HK, Bosnic-Anticevich S. (2002)** Use of CFC-free metered dose inhalers: do patients and pharmacists know what to do? *Aust Pharm;* 21:526–31.
- Sokol MC, McGuigan KA, Verbrugge RR, Epstein RS (2005)** Impact of medication adherence on hospitalization risk and healthcare cost. *Med Care.*43:521-530
- Tettersell M.J (1993).** Asthma patients' knowledge in relation to compliance with drug therapy. *Journal of advanced Nursing;* 18:103-113